RAMAKRISHNA MISSION VIDYAMANDIRA

(Residential Autonomous College under University of Calcutta)

B.A./B.Sc. FIFTH SEMESTER EXAMINATION, DECEMBER 2014

THIRD YEAR

Date : 20/12/2014 — **ECONOMICS (Honours)**

Time : 11 am – 3 pm — **Paper :** V — Full Marks : 80

[Use a separate Answer book for each Group]

Group – A

(*Answer **any three** questions*) [3×10]

1. Consider the general linear regression model as follows : $y^{n\times1} = X^{n\times k}\beta^{k\times1} + u^{n\times1}$

   a) Clearly state the assumptions which would enable you to come up with the OLS estimation of the vector of coefficients β. In particular, explain why X must be a full column rank matrix. [3]

   b) Given the above set-up, state & prove Gauss-Markov theorem. [7]

2. a) Consider the following model :

   $Y = X\beta + \in$, where X is the regressors matrix with K regressors, constant included. ·····> model (1)

   Now, consider the following model in which all the regressors are divided by a constant a :

   $$Y = \frac{1}{a}X\bar{\beta} + u \quad \cdots\cdots> \text{model (2)}$$

   i) Find out the relationship between the estimators in models (1) and (2). [2]

   ii) Show that R^2 is equal in both models. [2]

   iii) Calculate the Variance-Covariance matrix of the estimated regression coefficients of the second model on the basis of information provided below :
   Number of regressors = 3; a = 2; Variance-covariance matrix of the 1st model's estimated regression coefficients is

   $$\begin{pmatrix} 10 & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & 10 \end{pmatrix}$$ [2]

   b) Consider the following model : $wage = \beta_0 + \beta_1 educ + \beta_2 exper + \beta_3 exper^2 + \in$

   where 'wage' is the salary earned by a worker, 'educ' is the years of education, 'exper' is the years of job experience & '$exper^2$' is the squared years of job experience.

   Also, a partial information on the estimated model is :

   Dependent variable : wage
   Method : Least Squares
   Included Observations : 526

Variable	**Coefficient**	**Std. error**	**t-statistic**	**Probability**
Constant (intercept)	–4	0·75	–5·3	0
educ	0·5	0·05	11·25	0
exper	0·2	0·03	7·25	0
$exper^2$	–0·004	0·0008	–5·58	0

   i) Calculate the impact of experience on wages, where exper = 1. [2]

   ii) Consider testing the null hypothesis $H_o : \beta_2 + \beta_3 = 0\cdot25$ against $H_1 : \beta_2 + \beta_3 \neq 0\cdot25$. Write down the 't' test that you can apply in this case. Do you have all the required data in the table provided? [2]

3. Suppose in the model — $Y_i = \beta_1 + \beta_2 X_{2i} + \beta_3 X_{3i} + u_i$,

   r_{23} the coefficient of correlation between X_2 and X_3, is zero. Therefore someone suggests that you run the following regressions : $Y_i = \alpha_1 + \alpha_2 X_{2i} + u_{1i}$ & $Y_i = \gamma_1 + \gamma_3 x_{3i} + u_{2i}$

a) Will $\hat{\alpha}_2 = \hat{\beta}_2$ and $\hat{\gamma}_3 = \hat{\beta}_3$? Why? [3]

b) Will $\hat{\beta}_1$ equal $\hat{\alpha}_1$ or $\hat{\gamma}_1$ or some combination thereof? [4]

c) Will $\text{var}(\hat{\beta}_2) = \text{var}(\hat{\alpha}_2)$ and $\text{var}(\hat{\beta}_3) = \text{var}(\hat{\gamma}_3)$? [3]

4. An economist specifies the following regression equation of house prices (P_t in lacs), in terms of size ($SQFT_t$ in square metre), nearness to metro (MET_t = 1 if within 1 km, 0 otherwise), nearness to greenery (GR_t = 1 if within 500 mt, 0 otherwise), age (AGE_t in years) and security (SEC = 1 if in a complex of more than 50 houses, 0 otherwise) as

$$P_t = \beta_1 + \beta_2 SQFT_t + \delta_1 MET_t + \delta_2 GR_t + \beta_3 AGE_t + \delta_3 SEC_t + \gamma_1 (SQFT_t \times MET_t) + \in_t$$

The following results were obtained using 481 houses not near metro (MET = 0) and 519 houses near metro (MET = 1) :

R^2 = 0·8697 and the over all F statistic value is F = 1104·213

Estimates : $\beta_1 = 24500(0{\cdot}0001)$, $\delta_1 = 27453(0{\cdot}0012)$, $\beta_2 = 76{\cdot}121766(0{\cdot}0001)$,

$\gamma_1 = 12{\cdot}994049(0{\cdot}0001)$, $\beta_3 = -190{\cdot}086422(0{\cdot}0002)$, $\delta_2 = 4377{\cdot}163290(0{\cdot}0003)$,

$\delta_3 = 1649{\cdot}175634(0{\cdot}0901)$

Values in parenthesis are p-values.

Explain the nature of the model. Draw your conclusions by interpreting the parameters & their estimates. [2+8]

5. a) Explain the linear probability model & show that it violates the assumptions of homoscedasticity and normality of the disturbance term. How are these problems resolved? [5]

b) Explain the logit model and discuss why it is an improvement over the linear probability model. Is OLS method of estimation applicable in the Logit model if we have micro-level data? Explain. [5]

Group – B

Unit - I

Answer **any one** question : [1×5]

6. Mention few features of Indian financial Sector. [5]

7. What do you mean by convertibility of rupee in Indian context? [5]

Answer **any two** questions : [2×15]

8. a) Discuss critically the monetary policy of the RBI.
   b) Mention in this context the major constraints in successful implementation of the monetary policy. [8+7]

9. a) Critically discuss the reforms undertaken in Indian banking sector during last two and half decades.
   b) Analyse performance of the public sector banks in the post-reform period. [9+6]

10. a) Discuss some of the basic features of the export-import policy of Govt. of India in recent years.
    b) Comment in this context on the role of FDI in the Indian economy in recent period. [8+7]

11. a) Examine the trend and pattern of public expenditure in India.
    b) Discuss major changes in the direct tax structure in the post reform period. [8+7]

Unit - II

Answer **any one** question : [1×15]

12. a) Discuss the major economic impacts of "Operation Barga" in West Bengal.
    b) Discuss the changes in the cropping pattern in the agricultural sector of West Bengal in recent years. [8+7]

13. a) Discuss the problem of industrialization in West Bengal.
    b) What explain the industrial growth in West Bengal after 1990s? [10+5]

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